# Twin-to-twin-transfusion syndrome: From amniodrainage to laser.

German obstetrician Friedrich Schatz (1841-1920) and Austrian anatomist Joseph Hyrtl (1810-1894) were the first to study the placenta of the vascular architecture anatomy in twins using an injection technique similar those used in research nowadays. Schatz produced stunning descriptions of vascular anastomoses and is credited with the first description of a case of twin-to-twin-transfusion syndrome (TTTS) (Arch Gynäkol 1886;27:1-72). However, for many years the best-known complication of monochorionic twins was the reverse arterial perfusion (TRAP) sequence, called at that time ‘acardius anceps or monster’. In the first volume of BJOG, Kedarnath Das from Calcutta reported his own experience of a case and a review of 45 cases previously published in the medical literature (J Obstet Gynaecol Br Emp 1902;2:341-355). In 1914, G. Balfour Marshall from Glasgow, identified polyhydramnios in one sac of a couple ‘uniovular’ twins at 18 weeks (J Obstet Gynaecol Br Emp 1914;25:201-204).

In 1944 John P. Erskine, Registrar at Queen Charlotte’s Hospital in London, described the case of a primigravida with acute polyhydramnios at 21 weeks (J Obstet Gynaecol Br Emp 1944;51:549-551). With the help of X-rays he diagnosed a twin pregnancy and performed an amniodrainage inserting a lumbar puncture needle and attaching it with rubber tubing to a suction pump on the water tap. Seven pints of liquor were withdrawn, and the procedure was repeated at 24, 28 and 34 weeks. The woman eventually went into labour at 36 weeks, delivering a stillborn fetus and a live born baby of 3 pounds 9 ounces, who was later discharged at home.

Transabdominal puncture and removal of large volumes of amniotic fluid had been pioneered by Louis Carnac Rivett, Obstetric Surgeon at Queen Charlotte's Hospital a decade earlier in both singleton and twin pregnancies (J Obstet Gynaecol Br Emp 1933;40:522-525)**.** His technique revolutionized the management of polyhydramnios had low complication rates compared to previous techniques such as artificial rupture of the membranes and he was invited to present it in 1946 as the Joseph Brettauer Memorial lecture at 69th Annual Meeting of American Gynecological Society Transactions.

These ground-breaking reports on the diagnosis and successful treatment of what is now a well know complications of TTTS failed to identify a relationship between polyhydramnios and the vascular anastomoses typical of monochorionic twin placenta described in the second half of the 19$^{th}$ century. In last two decades, we have witnesses a better understanding of the pathophysiology of TTTS. This has led to the development of new technical tools and in particular fetoscopic laser (FLC) coagulation of the vascular anastomoses with major improvements in perinatal outcomes. In this issue of *BJOG*, the article by Stirnemann and colleagues (BJOG 2018) presents a series of 1092 cases of TTTS treated with FLC since 2000, highlighting how significant our skills in treating this once lethal complications of multiple pregnancy have improved. Research is now attempting to prevent complications of FLC, for example with membrane sealants, and to introduce non-invasive approaches such as high-intensity focused ultrasound (Shaw CJ et al. Sci Transl Med 2016;8:347ra95).

Word count: 499

## Disclosure of interests

The authors declare no conflicts of interest.

Federico Prefumo, Consultant Obstetrician, University of Brescia, Italy.

Eric Jauniaux, Professor, EGA Institute for Women's Health, Faculty of Population Health Sciences, University College London, UK.

BJOG Scientific Editors